

Brief Introduction to Materials Genome Initiative and Materials Informatics

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Materials play essential and fundamental roles in the civilization development of human being, as indicated by history names of the Stone Age, the Bronze Age, the Iron Age, etc. Materials Genome Initiative (MGI) was announced in June 2011. The core of MGI is to integrate high-throughput computation, high-throughput experimentation, and public accessible materials databases in order to discover, develop, manufacture, and deploy advanced materials at least twice as fast as possible today and at a fraction of the cost. Materials Informatics (MI) integrates machine learning with materials science and engineering, by employing techniques, tools, and theories drawn from the emerging fields such as data science, internet, computer science and engineering, and digital technologies to the materials science and engineering to accelerate materials, products and manufacturing innovations. This presentation introduces briefly the basic concepts and the success examples of MGI and MI, in particular, the development of MGI in the Mainland China.

Tong-Yi Zhang earned Master degree in 1982 and PhD in 1985, majoring in materials physics, from University of Science and Technology Beijing, China. He worked 1993-2015 at Hong Kong University of Science and Technology, as Lecturer, Associate Professor, Professor, Chair Professor, and Fang Professor of Engineering; works 2015- at Shanghai University, as founding dean of Materials Genome Institute, Shanghai University, and founding dean of Shanghai Materials Genome Institute. His research is on mechanical properties of materials. He has been a vice president of the International Congress on Fracture (ICF) since 2013 and was a vice president of The Far East and Oceanic Fracture Society 2001-2016. He was a recipient of two second prizes of the State Natural Science Award, China, and the 1988 National Award for Young Scientists, China. He became ICF Fellow in 2013, Fellow of the Hong Kong Academy of Engineering Sciences in 2012, member of Chinese Academy of Sciences in 2011, Senior Research Fellow of Croucher Foundation, Hong Kong, in 2003, Fellow of ASM International, USA, in 2001. He is Associate Editor-in-Chief of Science China Technological Sciences (2013 –) and the Fracture and Continuum Mechanics Subject-Editor of the journal, Theoretical and Applied Fracture Mechanics (2013 –).